



## Feed priorities in the Ethiopia livestock master plan

Investment in livestock agriculture in Ethiopia has the potential to halve poverty, improve the food security of rural people and make livestock an increasing contributor to GDP growth. Yet the high cost and low availability of good quality animal feed is perhaps the most critical constraint to increasing livestock productivity.

Poor feeding limits the ability of an animal to reach its genetic potential, so livestock grow slowly, produce little milk, are susceptible to diseases and produce few calves. If managed and fed properly, the average milk yield of a Horro cow at peak lactation on a traditional farm could more than double (Tolera 2012). Moreover, poor feed reduces the impact of other interventions, such as artificial insemination and oestrus synchronization, to boost livestock productivity. To meet its targets, the Ethiopia livestock master plan (LMP) gives feed availability a high priority.

### Moving targets

The LMP sets out ambitious year 2020 targets for several livestock value chains—crossbred dairy cows, red meat-milk and feedlot, and poultry.

These are designed to meet rapidly-growing demands for agricultural commodities, especially meat, milk and eggs. The 2020 targets aim to increase meat, milk and egg production by 58%, 83% and 828% respectively above 2012/2013 totals. These can only be met through secure year-round feed supplies.

These increases, as well as the expected rise of the crossbred cattle population to more than four million, will require enhanced forage and feed production and feeding services, including improved pasture productivity practices, and training for farmers on livestock feeding and forage production.

Table 1: Feed balance under different climatic conditions in 2013

Livestock zones of Ethiopia	Feed needs*	Feed resources good weather year	Feed resources average weather year	Feed resources bad weather year
Lowland grazing and agro-pastoral (LG)	48	68	51	34
Highland mixed crop-livestock rainfall deficient (MRD)	29	28	19	15
Highland mixed crop-livestock rainfall sufficient (MRS)	53	49	38	32
Total	130	145	108	81

\*Million metric tonne/ year)

Source: Livestock Sectorial Analysis

Analysis by ILRI and the Ministry of Agriculture (MoA) show, however, feed<sup>1</sup> requirements projected to exceed available resources in all production zones, except in the LG, during all years when rainfall is equal or above the long-term average.

## Future scenarios

Assuming a 'business as usual' scenario for feed resources (without major feed development interventions), the future outlook for feed availability is a great cause of concern. With LSA estimates foreseeing no change in the rates of animal growth—0.2–1.5% annual increases in cattle population—or dry matter requirements per animal—1.86 metric tonnes per head per year in the LG—the total feed requirements 15 years from now will rise to more than 165 million tonnes of dry matter (DM) per year: 56 million for the lowlands, 33 million for the rainfall-deficient and 76 million for the rainfall-sufficient mixed crop-livestock highland areas. This feed requirement would not be met under any climatic condition. The only feasible options are to increase the availability of feeds and to increase the productivity of feeding practices.

LSA estimates indicate it is possible to make commercial dairy farms or feedlots more productive by making available sufficient amount of improved forages and providing better extension services. Ambitious 2014/15 targets for growth of 190% in forage seed supply were set. Yet it is unlikely these targets will be met without increased private sector participation.

While the MoA has made a range of documentation on improving forage and feed production available to extension workers, this needs to be enriched to take account of the specific needs of particular livestock and production zones, especially lowland grazing zones, ensuring the effective transfer of this know-how to smallholder farmers/pastoralists, larger agribusinesses and other value chain actors.

It is estimated that additional public investment of 20 million Ethiopian birr (ETB) will be required to elaborate a livestock feed development strategy, and develop and implement the new extension services tools. A further ETB 30 million, 5 million from private sources, will be needed for further research.

## Transforming the livestock sector through feed interventions

### Overcoming forage feed shortages in highland areas

1. Facilitate the adoption of more productive forage production technologies, including: over-sowing with improved grass and legume species and bush clearing and thinning from grazing fields, the use of improved forage varieties with better management techniques, and crop-residue quality enhancement using urea and urea-molasses mixture treatment.

<sup>1</sup> The national feed resources potential in Ethiopia includes natural pasture (fodder; forage), cultivated forage, concentrates, blood meal, bone meal, crop residues, stubble grazing, brewery and winery by-products, oil seed by-products, molasses, sugarcane tops, other feed resources, such as foliage and pods, maize or sorghum thinning, cactus pear, etc.

2. Make forage seed production training available and encourage regional bureaus of agriculture and other actors to train development agents in the use of forage production technologies.
3. Support MoA and state research institutes to provide capacity-building support to research centres and seed enterprises.
4. Encourage federal and regional government officials and investment agencies to make land—that is fertile, irrigable and close to markets and credit services—available to private investors or public parastatals interested in forage seed and feed production, ensuring sufficient supply for emerging market-oriented livestock operations.

### Overcoming processed feed shortages in highland areas

1. Make large plots of land and credit available to investors at reduced rates to encourage them to invest in large-scale commercial animal feed production and processing operations.
2. Revisit the animal-feed tax policy to avoid double taxation; grant periodic tax exemptions for feed ingredients and compound feeds to nurture industry growth and encourage increased private investment.
3. Implement the Ethiopian proclamation on feed quality standards, feed safety control, and import, export and trade of feed.
4. With policy makers and other stakeholders, establish accreditation of private analytical service laboratories to ensure quality feed production.
5. Promote the establishment and use of oil extraction and flour milling factories so oil seed by-products are produced locally for feed, and discourage, through the use of taxes and quotas, their importation and exportation.
6. Promote private investment in large-scale production of soybean and maize as inputs for feed processing, through the facilitation of land and the provision of tax incentives, as well as large- and small-scale feed formulation and processing companies.
7. Organize policy dialogue fora for relevant stakeholders and policy-makers to raise awareness of the critical importance of livestock feed.
8. Encourage key stakeholders to organize visits to other countries whose processing-industry-experience practices could be used as a benchmark in order to help develop efficient feed processing industries.
9. Encourage relevant state and non-state actors to organize awareness-raising meetings on the development of storage of processed feeds and related ingredients to help minimize seasonal price fluctuations.
10. Give training by development agents and other actors to farmers on animal husbandry, forage production and management, crop residue treatment and utilization and cattle fattening practices.



### Overcoming lowland pastoral and agro-pastoral feed shortages

1. Provide herd management training to pastoralists on camel, sheep and goats, and cattle husbandry, pasture production and management, crop residue improvement and utilization, milk handling and clean milk production procedures.
2. Promote ecologically-sound water point development and distribution in the lowland areas to avoid localized degradation, soil erosion and gully formation that reduce the potential to produce good quality forages.
3. Promote herd mobility as a strategy to utilize temporal and spatial variability in the availability of forages.
4. Promote bush clearing and thinning, and the use of controlled burning as a range management technique to increase production of good quality forages.

### Natural resource management (NRM) activities to increase forage availability

1. Increase the linkages between crop and livestock production by promoting the use of crop residues for animal feeding and manure recycling to crop farms as fertilizer.
2. In response to the prevailing rising incomes and population, reinforce the role of improved crop residues as feed by encouraging collaborative systems-orientated research, in which crop, livestock and natural resource researchers participate in the development of multipurpose crop varieties with high grain and good quality stover yields.
3. Ensure NRM activities are integrated with livestock feed production by growing species on degraded land in enclosures established to rehabilitate degraded grazing lands, using the herbage biomass obtained from these systems as cut-and-carry fodder.

4. Integrate reforestation activities with livestock production by incorporating multipurpose tree species like *Leucaena*, *Sesbania* and *Tagasaste* with NRM interventions, so the fodder can be used as a protein supplement for livestock subsisting on low-quality crop residues and grasses.

### Forage-livestock production research gaps

1. Develop crop management technologies for improved forage seed availability by strengthening the capacity of researchers working in the areas of forage and forage seed production.
2. Encourage national and regional research institutions to design alternative livestock feeding strategies, based on non-conventional feed resources, to alleviate the escalating cost of industrial feeds, and plan and implement alternative feeding trials on different classes of cattle and animal species.
3. Monitor the long-term effects of bush encroachment in savannah areas on human settlements, soil seed banks, and competition for soil moisture and soil nutrients that affect the regeneration of invasive woody plants across different landscapes related to grazing pressure.
4. Engage in field-based monitoring and research to confirm the perceptions of pastoralists regarding vegetation change.
5. Encourage national and international research institutes to engage in research on the link between climate change and grazing pressure in driving bush encroachment and the consequences on cattle populations.
6. Undertake research to better understand the long-term effects of bush encroachment control methods on the regeneration of invasive woody plants and the restoration of herbaceous plant biodiversity.
7. Engage in research on the effects of various small-scale bush-encroachment control methods on the forage reserves of communities to strengthen community education and launch range rehabilitation efforts.



## Background to the LMP

Since 2014, the Livestock Resources Development Sector (or Livestock State Ministry) of the Ethiopian MoA and ILRI have been collaborating to develop a livestock master plan (LMP) to provide guidance to the government of Ethiopia on future priorities for livestock research and development activities.

The LMP project development process was funded by the Bill & Melinda Gates Foundation (BMGF). Beyond the plan itself, the project aims to build the capacity of the government to carry out data-driven, fact-based analytics and planning.

The LMP was developed by a joint team from ILRI and the MoA. Development was overseen by a high-level technical advisory committee (TAC) comprising directors of key MoA Livestock State Ministry departments and institutes, as well as representatives from the Food and Agriculture Organization of the United Nations (FAO), the Intergovernmental Authority on Development (IGAD), the Ethiopian Agricultural Transformation Agency (ATA) and the presidents of the relevant professional associations of livestock experts (the Ethiopian Society of Animal Production and the Ethiopian Veterinary Association).

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